

**REMARKS**

The present Amendment and Response is filed in response to an Office Action (non-final) mailed on May 27, 2004. As amended, claims 1, 2, 4, 5, 8, 10, 12, 13, 17, 19-21, 30, 31 and 35-44 are pending in the application. Reconsideration of the present application is respectfully requested.

**1. Drawing Objection**

Applicant notes with appreciation the withdrawal of the outstanding drawing objection in the current Office Action.

**2. Claim Amendments**

Applicant has amended the claims, without prejudice, as follows:

**Independent claim 1** has been amended to more clearly recite advantageous aspects of the “at least one magnet” and the “commutator core” that are included in the claimed commutator. In particular, applicant has amended element “a” to include a recitation with respect to “pre-form mixture comprising a magnet powder and a thermo-set resin binder.” Support for the amendment to element “a” is found in the specification, *inter alia*, at page 5, lines 5-9. Applicant has also amended element “b” to recite “a resin-containing commutator core.” Support for the amendment to element “b” is found in the specification, *inter alia*, at page 6, lines 14-19 (as amended in the Preliminary Amendment dated July 18, 2002) (“via inter-bonding of resins contained in both the core 14 and the magnet 16”). Accordingly, applicant respectfully submits that the amendments to independent claim 1 find support in the specification, as filed.

**Dependent claim 35** has been amended to ensure consistency with the amended language of independent claim 1.

**Independent claim 39** has been amended so as to recite “an electrically-insulating, resin-containing commutator core.” Support for this recitation is found in the specification, *inter alia*, at page 5, lines 19-21 and page 6, lines 14-19 (as amended in the Preliminary Amendment dated July 18, 2002). Accordingly, applicant respectfully submits that the amendments to independent claim 39 find support in the specification, as filed.

**New dependent claims 40-44** have been added by applicant. Support for these new dependent claims is found at page 5, line 5 to page 6, line 22 (as amended by a Preliminary Amendment dated July 18, 2002).

Applicant respectfully submits that the claim amendments set forth herein do not raise any issue of new matter. Prompt entry of the proposed claim amendments is respectfully requested.

3. Rejections Pursuant to Section 112, para. 1

In the outstanding Office Action, claims 1, 2, 4, 5, 8, 10, 12, 13, 17, 19-21, 30, 31 and 35-39 were rejected under 35 U.S.C. § 112, para. 1. More particularly, the examiner expressed the view that the specification failed to provide written description support for a commutator core comprising a “thermosetting resin.” Applicant respectfully disagrees with the examiner’s view. The specification expressly states that, in exemplary embodiments of the present disclosure, the commutator core 14 and the magnet 16 are bonded at an interface therebetween “typically via inter-bonding of resins contained in both the core 14 and the magnet 16.” [Page 6, line 16, as amended by Preliminary Amendment dated July 18, 2002; emphasis added.] The specification further expressly states that the commutator core is typically “phenolic” [see page 5, lines 19-21; page 6, lines 9-11 (as amended by Preliminary Amendment dated July 18, 2002)]. As is well known to persons skilled in the art, phenolic materials generally provide thermoset properties. For example, as stated in the two page reference enclosed herewith [[http://materials.globalspec.com/LearnMore/Materials\\_Chemicals\\_Adhesives/Plastics\\_Elas...](http://materials.globalspec.com/LearnMore/Materials_Chemicals_Adhesives/Plastics_Elas...)]:

Thermosets and thermoset resins are crosslinked polymeric resins cured or set using heat or heat and pressure. Cured thermoset resins do not melt and flow when heated, but they may soften. Cured thermoset resins generally have higher resistance to heat compared to thermoplastics, but they cannot be reprocessed by melting. Phenolic, melamine and urea formaldehyde resins are thermosetting resins that offer strong bonds and good resistance to high temperatures.

Notwithstanding the foregoing written description support, applicant has amended independent claims 1 and 39 in a manner that is believed to obviate the outstanding rejection based on written description. In particular and as noted above, applicant's amended independent claims recite, *inter alia*, a "resin-containing" commutator core. Support for the "resin-containing" recitation is found, *inter alia*, at page 6, lines 14-19 (as amended by Preliminary Amendment dated July 18, 2002). Applicant's dependent claims are consistent with such claim recitation. Accordingly, reconsideration and withdrawal of the outstanding rejection under Section 112, para. 1, are respectfully requested.

4. Rejections Pursuant to 35 U.S.C. § 103(a)

Applicant notes with appreciation that the outstanding rejections based on Nishimura (JP 11-308812) and Vig (US 6,278,269) have been withdrawn by the examiner. In the outstanding Office Action, the following art-based rejections were advanced:

- Claims 1, 2, 4, 19, 21 and 30 were rejected over Furuya et al. (JP 08-223889) and Kageyama et al. (US 6,390,484).
- Claims 35, 36, 37, 5, 8, 10, 12, 13 and 31 were rejected over Furuya and Kageyama, further in view of Kawashima (US 4,678,616).
- Claim 38 was rejected over Furuya, Kageyama and Kawashima, further in view of Uchiyama (JP 11-252,866).
- Claim 17 was rejected over Furuya, Kageyama and Kawashima, further in view of Marsal (US 2,645,732).
- Claim 20 was rejected over Furuya, Kageyama and Kawashima, further in view of Adler (US 5,850,141).

Reconsideration is respectfully requested.

i. Claims 1, 2, 4, 19, 21 and 30

Each of the art-based rejections is predicated (at least in part) on the teachings of Furuya and Kageyama. The Furuya document is a Japanese document; applicant does not have access to an English translation of Furuya. Based on a review of the English language abstract from the "Dialog" database and a review of the figures, applicant takes issue with the characterization of Furuya for the reasons set forth herein.

Furuya discloses a “frequency generator structure [that] consists of a rotating magnetic disc (6-1) fixed in a commutator unit (13) and is (sic) fixed magnetic sensor (11-1) mounted in a support part (28) of a stator of a small motor.” (emphasis added) Furuya further states (translated abstract on face of patent) that its purpose is “[t]o form a motor in a small size by forming an FG magnet integrally with a commutator unit.” Furuya neither teaches nor suggests chemical bonding of at least one magnet to a commutator core “via inter-bonding of the resins in the at least one magnet and the core,” as expressly claimed in applicant’s amended independent claim 1. Furuya is silent as to the manner in which the magnetic disc might be “fixed” relative to the commutator unit or be formed “integrally” therewith. To surmise that Furuya intends chemical inter-bonding between a magnetic disc and a commutator core goes far beyond the teachings of the reference.

Indeed, with further reference to the English language abstract associated with the Japanese patent, Furuya describes the “constitution” of the structure as involving “[a]n FR magnet 6-1 [that] is fixed to a commutator unit 13.” This teaching clearly suggests that the Furuya magnet 6-1 is fully formed before it is brought into juxtaposition with commutator unit 13, at which point is “fixed” thereto. In the absence of a contrary teaching within Furuya, the clear import is a mechanical “fixing” of the magnet relative to the commutator unit. Furuya’s statement that a magnetic disc may be “fixed” relative to a commutator unit clearly does not teach or suggest applicant’s claimed “inter-bonding of resins.” Furuya’s Figure 5c, which is referenced by the Examiner, does nothing to cure the clear deficiency in the teaching of Furuya. In short, the Furuya fails to teach or suggest a commutator that includes: (i) at least one magnet formed from a pre-form mixture comprising a magnet powder and a thermo-set resin binder, and/or (ii) a resin-containing commutator core, and/or (iii) at least one magnet that is chemically-bonded to the commutator core via inter-bonding of the resins in the at least one magnet and the core.

Turning to Kageyama, a conventional mold type commutator is disclosed. As noted by the Examiner, the Kageyama structure may include “a thermosetting core 12 and a copper shell 31, with radial anchors 21.” However, as with Furuya discussed above, Kageyama fails to teach or suggest fails to teach or suggest a commutator that includes: (i) at least one magnet formed

from a pre-form mixture comprising a magnet powder and a thermo-set resin binder, and/or (ii) at least one magnet that is chemically-bonded to the commutator core via inter-bonding of the resins in the at least one magnet and the core.

Thus, for the foregoing reasons, applicant respectfully submits that the proposed combination of Furuya and Kageyama fails to teach or suggest applicant's claimed commutator, as recited in independent claim 1, that includes (i) at least one magnet that is formed from a pre-form mixture comprising a magnet powder and a thermo-set resin binder, (ii) a resin-containing commutator core, and (iii) wherein at least one magnet is chemically-bonded to the commutator core via inter-bonding of the resins in the at least one magnet and the core. Reconsideration and withdrawal of the outstanding art-based rejection of independent claim 1, as amended, is respectfully requested.

Dependent claims 2, 4, 19, 21 and 30 patentably distinguish over the Furuya/Kageyama combination for at least the reasons noted with respect to independent claim 1. Accordingly, reconsideration and withdrawal of the outstanding art-based rejection of such dependent claims is respectfully requested.

*ii. Claims 35, 36, 37, 5, 8, 10, 12, 13 and 31*

Dependent claims 35, 36, 37, 5, 8, 10, 12, 13 and 31 stand rejected based upon the teachings of Furuya and Kageyama, further in view of Kawashima. Reconsideration is respectfully requested.

Kawashima teaches a method for magnet production that involves molding of a ferromagnetic powder to form a columnar or cylindrical body. The molded material may further include a plastic matrix which may be a thermosetting or thermoplastic material. However, Kawashima fails to cure the deficiencies in Furuya and Kageyama, discussed above. In particular, Kawashima fails to teach or suggest a commutator, wherein at least one magnet is chemically-bonded to the commutator core via inter-bonding of the resins in the at least one magnet and the core. Indeed, Kawashima teaches molding magnetic structures independent from a commutator core, thereby effectively teaching away from applicant's advantageous commutator. Accordingly, applicant respectfully submits that dependent claims 35, 36, 37, 5, 8,

10, 12, 13 and 31 are patentable over the proposed combination of Furuya, Kageyama and Kawashima for at least the reasons noted above with respect to independent claim 1.

Reconsideration and withdrawal of the outstanding rejection of claims 35, 36, 37, 5, 8, 10, 12, 13 and 31 is respectfully requested.

*iii. Claims 38, 17 and 20*

Dependent claims 38, 17 and 20 are directed to exemplary aspects of applicant's claimed commutator. Each of these dependent claims is rejected based on a combination that is predicated on Furuya, Kageyama and Kawashima. In the case of each dependent claim, a further secondary reference is relied upon with respect to the exemplary feature recited therein.

However, the additional secondary references (Uchiyama, Marsal and Adler, respectively) fail to cure the deficiencies noted above with respect to the underlying combination of Furuya, Kageyama and Kawashima. Applicant respectfully submits that dependent claims 38, 17 and 20 are patentable for at least the reasons noted above with respect to independent claim 1.

Reconsideration and withdrawal of the art-based rejections of these new claims is requested.

5. New Dependent Claims 40-44

New dependent claims 40-44 are directed to further exemplary aspects of applicant's claimed commutator. The subject matter of dependent claims patentably distinguishes over the art of record for at least the reasons noted above with respect to independent claim 1.

Accordingly, prompt allowance of these new dependent claims is earnestly solicited.

6. Conclusion

Applicant respectfully submits that all claims are now in condition for allowance. Prompt action leading to an early Notice to this effect is earnestly solicited. If the examiner believes a telephone communication might be useful in advancing prosecution of the subject application, the examiner is invited to contact the undersigned representative of the applicant.

Respectfully submitted,



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Thermosets and thermoset resins are crosslinked polymeric resins cured or set using heat or heat and pressure. Cured thermoset resins do not melt and flow when heated, but they may soften. Cured thermoset resins generally have higher resistance to heat compared to thermoplastics, but they cannot be reprocessed by melting. Phenolic, melamine and urea formaldehyde resins are thermosetting resins that offer strong bonds and good resistance to high temperatures. Epoxy and alkyd polyester resins are widely used thermosetting plastics. Vulcanization is a thermosetting reaction involving the use of heat and/or pressure in conjunction with a vulcanizing agent, resulting in greatly increased strength, stability and elasticity in rubber-like materials. The vulcanizing agent is a crosslinking compound or catalyst. Sulfur is the traditional vulcanizing agent used with natural rubber. RTV silicone rubbers are room temperature vulcanizing materials. Silicones use moisture, acetic acid and other compounds as curing agents. Thermosets fall under the general category of industrial plastics and polymers.

**Related keywords:** BMC, epoxy resin, polyurea, plastic resin, resorcinol, thermoforming plastic, phenolic resin, butyl, silicone sheet, epoxy prepeg, pultruded profile, vinyl ester resin, epoxy system, melamine product, isoprene

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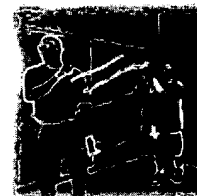
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